

weather and higher temperatures with rain or snow in Washington and Oregon and rain in northern California within the next 36 hours, and continued fair weather with zero temperatures in Idaho and Nevada was issued and given to the press.

Storm warnings were ordered on 17 days and frost warnings issued repeatedly between the 9th and 27th. The warnings were generally timely and verified.

The record for low temperature in December, was broken at North Head, Eureka, Winnemucca, Boise, and Pocatello during the month.—*G. H. Willson.*

627.41 (73)

RIVERS AND FLOODS

By H. C. FRANKENFIELD

Inspection of the table following will disclose the fact that no floods of consequence occurred during the month of December. Those that did occur were confined mainly to some of the rivers of the Carolinas and to the Kentucky and Green Rivers of Kentucky and the Wabash River of Indiana. The heavy rains of December 7 and 8 would ordinarily have caused severe floods in the rivers of South Carolina and Kentucky, but the preceding season had been so devoid of rainfall that the soil absorbed much of the water that would ordinarily have gone into the rivers. This is especially true of the Kentucky and Green drainage areas over which the rainfall for the two days mentioned ranged from 3.5 to 8.5 inches, yet the resulting floods were only moderate and without damage of consequence. The Wabash River flood of the third decade of the month was somewhat more pronounced, although not at all dangerous. The soil was moist from the earlier rains of the month and the heavy fall from December 17 to 19 was sufficient to raise the river a few feet above flood stages, except at Lafayette, Ind., where the excess was 10.2 feet. Here also the losses were small. The remaining floods noted in the table do not need special mention.

The loss and damage resulting from the floods were virtually nothing in the Carolinas and Georgia, and only about \$8,000 elsewhere, with reported savings through the warnings issued of at least an equivalent amount.

Other rivers were low as a rule. At the close of the month the Mississippi River was frozen over as far south as Hannibal, Mo., or a short distance below, while the Missouri River was frozen to a short distance below the mouth of the Kansas River. On December 29 an ice gorge formed in the Mississippi River at Turkey Island, about 55 miles below St. Louis, backing up the water above to such an extent that the river at St. Louis rose from 3.7 feet on the morning of December 29 to 11 feet at midnight December 31, with a further slow rise to 12.6 feet by January 5, 1925.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
Roanoke, Weldon, N. C.....	<i>Feet</i> 30	11	11	<i>Feet</i> 32.0	11
Santee:					
Rimini, S. C.....	12	$\left\{ \begin{array}{l} 12 \\ 25 \end{array} \right.$	$\left\{ \begin{array}{l} 10 \\ (1) 22 \end{array} \right.$	13.8	14
Ferguson, S. C.....	12	$\left\{ \begin{array}{l} 12 \\ 26 \end{array} \right.$	$\left\{ \begin{array}{l} 22 \\ (1) \end{array} \right.$	13.3	15-16
Saluda:					
Pelzer, S. C.....	7	10	10	7.6	10
Chappells, S. C.....	14	25	25	15.2	25
Oconee, Milledgeville, Ga.....	22	25	25	23.3	25

¹ Continued at end of month.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
Licking, Falmouth, Ky.	Feet 28	8	9	Feet 29.2	9
Kentucky:					
High Bridge, Ky.	30	9	9	31.3	9
Frankfort, Ky.	31	9	10	32.0	9
Green:					
Munfordville, Ky.	28	9	12	30.3	11
Lock No. 6, Brownsville, Ky.	30	8	12	37.2	12
Lock No. 4, Woodbury, Ky.	33	8	14	42.2	11
Lock No. 2, Rumsey, Ky.	34	13	16	35.4	15
Big Barren, Bowling Green, Ky.	20	9	10	21.0	10
Wabash:					
Lafayette, Ind.	11	19	23	21.2	21
Terre Haute, Ind.	16	20	27	19.4	24
Vincennes, Ind.	14	24	30	16.7	28
Mount Carmel, Ill.	16	28	28	16.0	28
White, West Fork:					
Noblesville, Ind.	14	20	20	14.7	20
Elliston, Ind.	19	22	24	20.4	23
Edwardsport, Ind.	15	22	26	17.4	25
Big Pigeon, Newport, Tenn.	6	9	9	6.7	9
Meramec:					
Steelville, Mo.	12	20	20	12.1	20
Pacific, Mo.	11	20	22	16.0	22
Bourbeuse, Union, Mo.	10	30	21	12.4	21
White, Batesville, Ark.	23	21	21	23.9	21
Gasconade, Arlington, Mo.	12	20	21	13.0	20
PACIFIC DRAINAGE					
Willamette, Eugene, Oreg.	10	30	(1) 30	14.0	30
Santiam, Jefferson, Oreg.	10	30	30	11.0	30

MEAN LAKE LEVELS DURING DECEMBER, 1924

By UNITED STATES LAKE SURVEY

[Detroit, Mich., January 5, 1925]

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes ¹			
	Superior	Michigan and Huron	Erie	Ontario
Mean level during December, 1924:				
Above mean sea level at New York	Feet 601.49	Feet 578.48	Feet 570.84	Feet 244.58
Above or below—				
Mean stage of November, 1924	-.23	-.28	-.24	-.37
Mean stage of December, 1923	-.24	-.32	-.41	+1.11
Average stage for December last 10 years	-.78	-1.43	-.86	-.66
Highest recorded December stage	-1.64	-4.10	-2.69	-3.03
Lowest recorded December stage	+1.29	-.32	-.02	+1.15
Average relation of the December level to:				
November level		-.2		-.2
January level		(2)	+1	(2)

¹ Lake St. Clair's level: In December, 1924, 573.49 feet.

² Practically no difference.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS—DECEMBER, 1924

By J. B. KINCER

General conditions.—The outstanding features of the weather in relation to agricultural interests during December were the breaking of the widespread drought from the Mississippi Valley eastward during the first part of the month and the unusually cold weather which interrupted all outdoor operations over most of the country during the latter half. The first copious rainfall for a long time occurred over the States from the Ohio and middle Mississippi Valleys southward, and the drought, which had become the most severe of record in parts of that area, was effectually relieved. In central and east Gulf and South Atlantic districts the increased moisture facilitated plowing, while vegetation in general was favorably affected. Except for some interruption by rainfall, seasonable outdoor operations made good progress in

Southern States during the first half of the month, but heavy snow or glaze in parts of the Great Plains and upper Mississippi Valley interrupted rail and highway traffic and did considerable damage, especially to overhead wires.

During the last half of the month outdoor work was largely at a standstill from the Great Plains eastward, because of the cold and stormy weather. Fortunately a good covering of snow was deposited on grain and grass fields over the northern half of the country previously to the cold weather, but at the same time a considerable part of the central Mississippi Valley and much of the western Lake region was covered, soon after the middle of the month, with an ice sheet which persisted till the close. Damaging cold did not reach the winter trucking districts of the Southeast and no extensive harm from frost was reported from that area, though protective measures were employed in some sections. Conditions were mostly favorable for husking corn, except for some interruption by precipitation, and good progress was made in picking the remnant of the cotton crop in the northern and northwestern parts of the belt.

Small grains.—Under the influence of mild temperatures and beneficial precipitation during the first half of the month, winter wheat made satisfactory progress quite generally, though more moisture was needed in the southwestern part of the Wheat Belt. The crop showed improvement in the Ohio Valley and Great Plains States with the unfrozen soil absorbing the moisture resulting from melting snow in much of the latter area. The Middle Atlantic States and the South also reported improvement in all winter cereal crops, while conditions continued favorable in the far Northwest.

The southeastern portion of the Winter Wheat Belt was bare of snow when the cold weather set in soon after the middle of the month, and the sudden change from growing conditions to a severe freeze was rather hard on the succulent plants, and at the same time there was apprehension as to possible damage by reason of the ice-covered fields in Missouri, west-central Illinois, and parts of the western Lake region. In other parts of the Wheat Belt the fields were generally well protected by

snow. There was a good covering also over Rocky Mountain districts and the far Northwest, but the cold was unfavorable for winter oats in the South.

Ranges, pastures, and livestock.—Rainfall early in the month improved pastures and ranges in the far West, the Southwest, and generally in the Southern States, while the open condition of the range permitted much grazing in the northern Great Plains. The sudden change to cold about the middle of the month, however, was hard on livestock over the western half of the country, and considerable suffering and shrinkage were reported, though no material losses occurred, except in parts of Texas where sleet was heavy. Much feeding was necessary and widespread protective measures were employed. Snowfall was beneficial in replenishing the water supply over the northwestern Great Plains and some improvement resulted in the southwestern range by precipitation near the close of the month.

Miscellaneous crops.—In the South Atlantic and east Gulf States winter truck crops were favorably affected by the weather during the first two weeks of the month and fairly good progress was noted, though it continued too dry and too warm for the hardier varieties of truck in parts of Florida. The rainfall was especially helpful to fall-planted cane in Louisiana, and the damp weather facilitated the handling of tobacco in the Ohio Valley and Atlantic Coast States. In California the timely rains resulted in marked improvement in truck crops, while peas and lettuce did well in Arizona.

The latter part of the month was rather too cold for best results in the winter trucking districts of the Southeast, and there was considerable damage by frost in the west Gulf area, while some harm from the same cause was reported from California. The warm weather in southern Florida was somewhat unfavorable for citrus fruit, while, on the other hand, considerable damage from frost occurred in parts of California, and some harm was reported from west Gulf districts. In general, however, the citrus outlook continued satisfactory. Damage was reported to peach buds in parts of the central Rocky Mountain area.